

## BLOW MOLDED DRUM

This application is a continuing application of U.S. Application No. 09/541,871, filed April 3, 2000, <sup>now abandoned,</sup> which is a continuation-in-part of U.S. Application No. 08/982,671, filed December 2, 1997, now ~~issuing as~~ U.S. Patent No. 6,045,000 issued April 4, 2000. Said applications and patent are hereby incorporated by reference in their entirety.

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## BACKGROUND OF THE INVENTION

This invention relates to drums or barrels. More particularly it relates to plastic drums with drum inserts for accessing the fluid in the drum and closures for same.

Steel and plastic drums are utilized in many industries for transporting and storing various liquids which may be utilized as fuels, lubricants, ingredients, process fluids, or the like. Often the liquids transported and stored in such drums are highly caustic and/or hazardous and absolute containment during storage, transport, and handling are essential. For example in the semiconductor industry, caustic chemicals such as hydrofluoric acid are commonplace. Some liquids develop significant internal gas pressures when contained during storage. Such pressures must be periodically vented. Even when drums with such hazardous and caustic liquids are on site and ready for use, great care must be taken in accessing the liquids so as not to expose personnel or the environment to such chemicals.

Plastic drums utilized in the semiconductor processing industry typically have standardized openings on the top of the drums. These openings comprise a pair of ports or bungholes, each having a fitting with a neck extending upward from the top wall of the drum approximately 1 to 1 1/2 inches. The ports each have 2-inch internal buttress threads. Several closures or bungs may be utilized with these standardized ports including standard bung closures which are threadedly inserted into the openings and which engage with the top shoulder of the neck. These standard bung closures extend a fraction of an inch above the neck.

Access to the liquids in the plastic drums is typically accomplished by multiple port bung connectors which attach to drum inserts such as disclosed in U.S. Pat. No. 4,699,298, issued to Grant, et al, and assigned to FSI International Corporation and as disclosed in U.S. Pat. No.

09/541,871